

University of Groningen

Amylase catalyzed synthesis of glycosyl acrylates and their polymerization

Kloosterman, Wouter M.J.; Jovanovic, Danijela; Brouwer, Sander; Loos, Katja

Published in:
Green Chemistry

DOI:
[10.1039/c3gc41471j](https://doi.org/10.1039/c3gc41471j)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2014

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Kloosterman, W. M. J., Jovanovic, D., Brouwer, S., & Loos, K. (2014). Amylase catalyzed synthesis of glycosyl acrylates and their polymerization. *Green Chemistry*, 16(1), 203-210.
<https://doi.org/10.1039/c3gc41471j>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Electronic Supplementary Information

Amylase Catalyzed Synthesis of Glycosyl- Acrylates and their polymerization

*Wouter M. J. Kloosterman, Danijela Jovanovic, Sander G. M. Brouwer, Katja Loos**

Department of Polymer Chemistry, University of Groningen, Nijenborgh 4,
9747 AG Groningen, the Netherlands

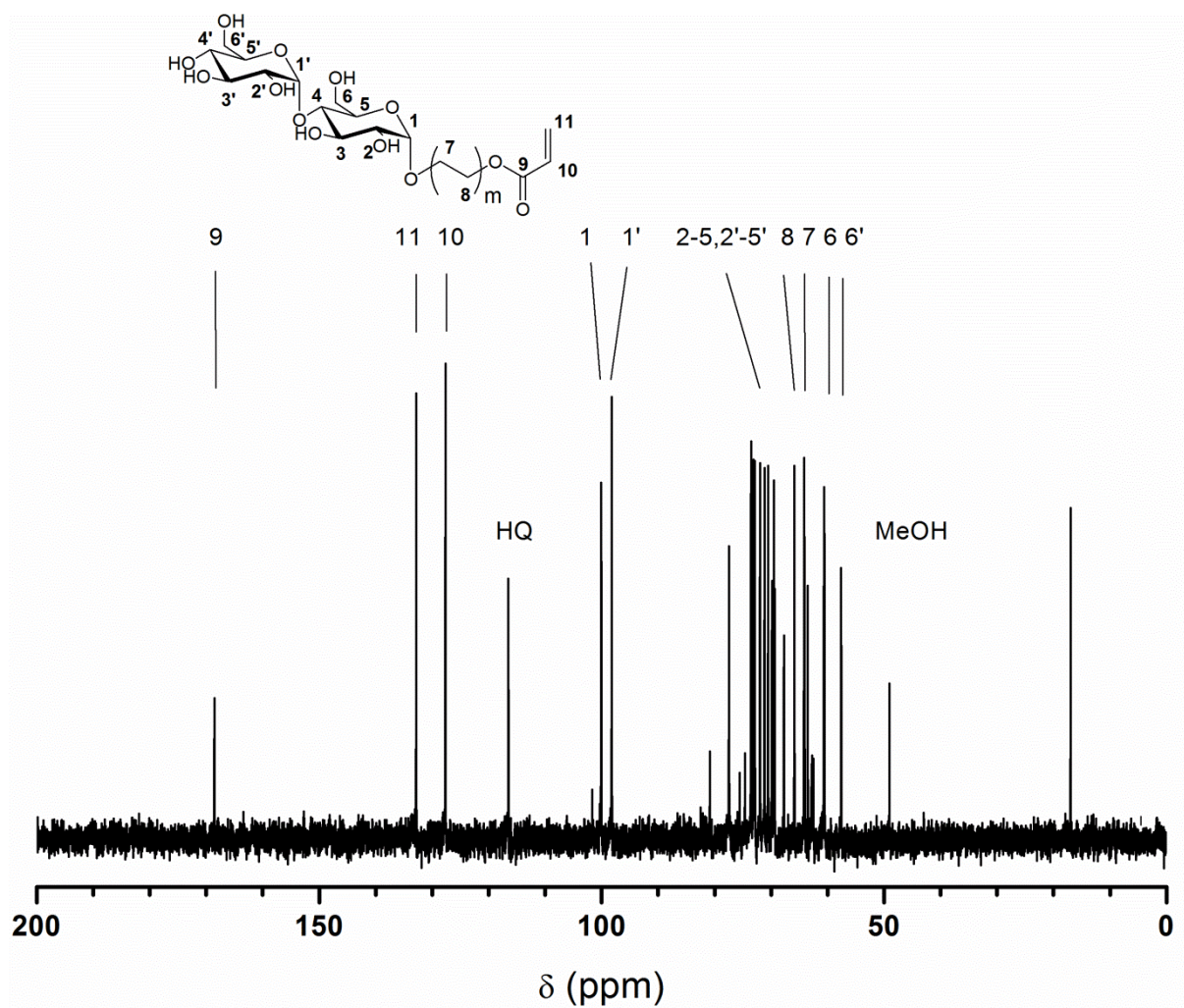


Figure S1. ^{13}C -NMR of Glc-Glc-EA

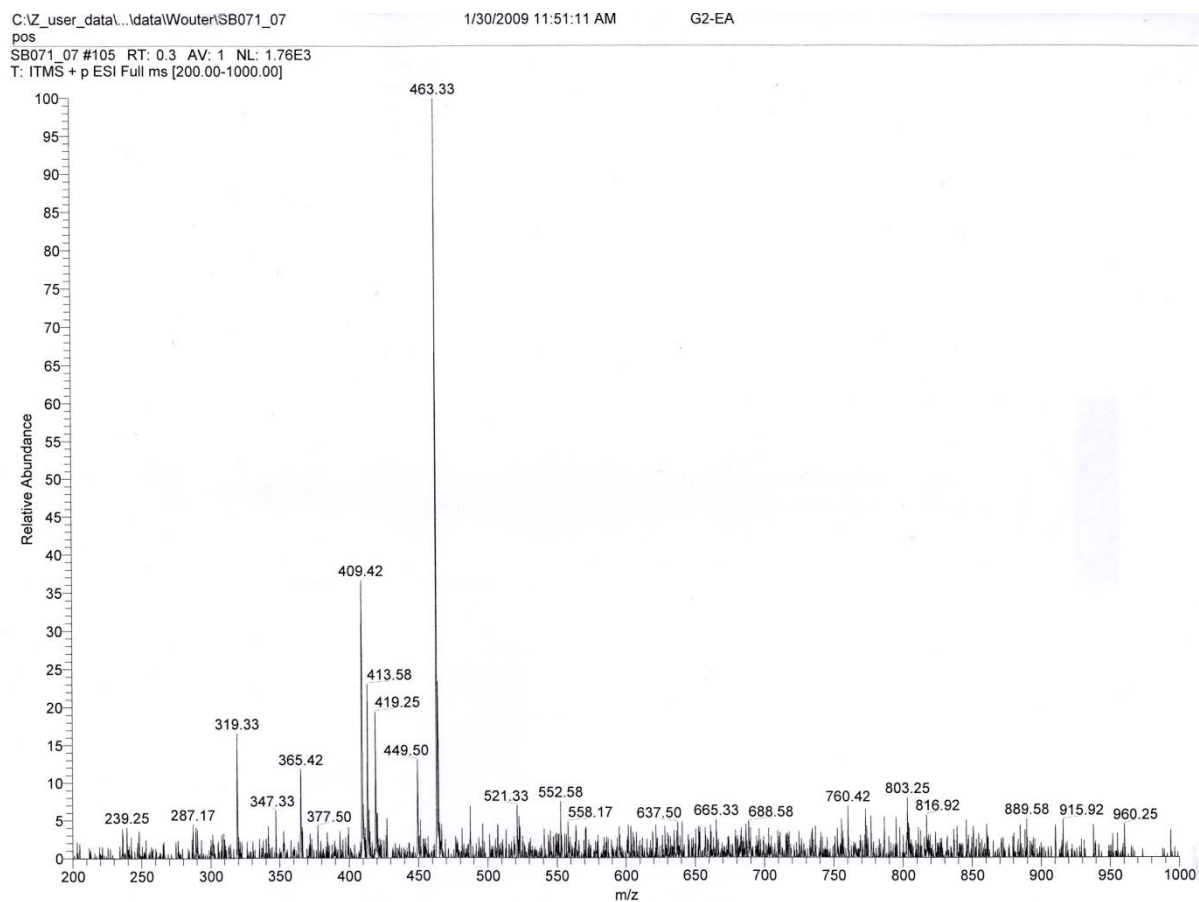


Figure S2. Positive ion ESI-MS spectrum of Glc-Glc-EA

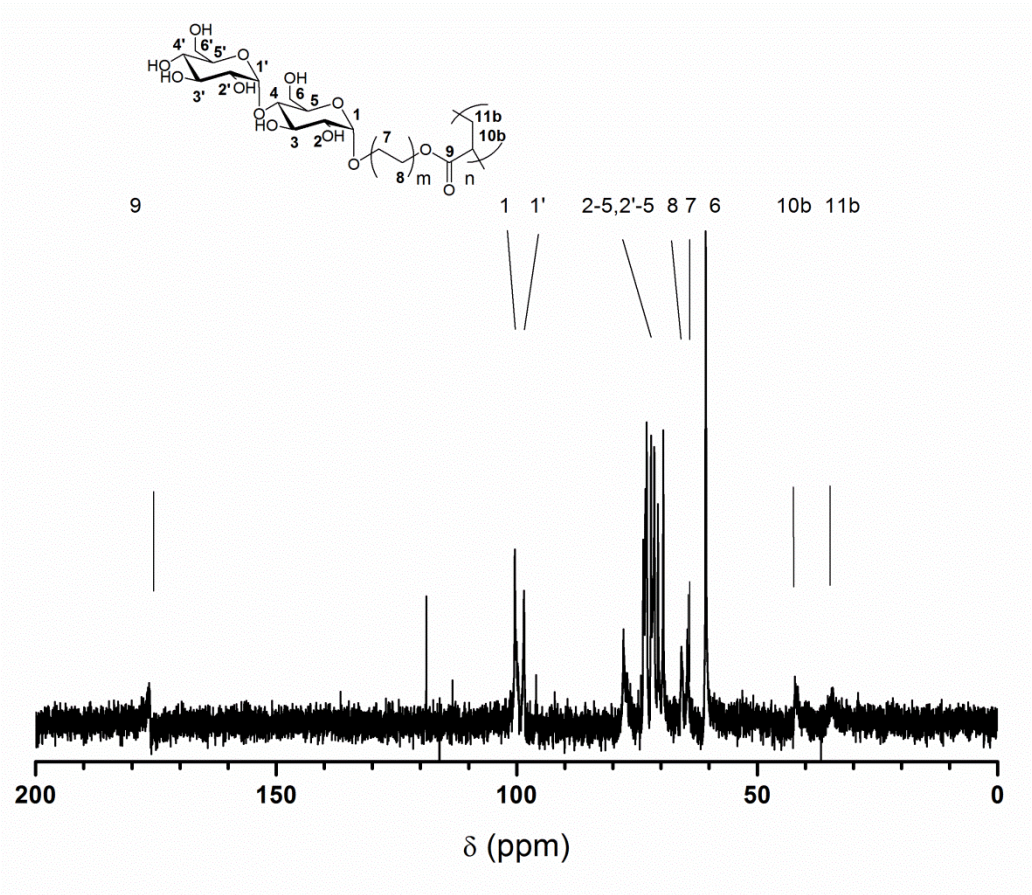


Figure S3. ^{13}C -NMR of Poly(Glc-Glc-EA)

Figure S4 Hydrolytic activity of tested amylases as determined by the DNSS method.

Saccharification amylases

1 U = amount of enzyme that liberates 1 μmol maltose per minute at pH 6.0, 25 $^{\circ}\text{C}$ using starch as the substrate

Entry	Tradel name	Enzyme type	Enzyme origin	Hydrolytic activity (U/ μL)
1	A8220	α -amylase	<i>Aspergillus oryzae</i>	16
2	A7595	α -amylase	<i>B. amyloliquefaciens</i>	9
3	Biokleitase L500	α -amylase	<i>B. amyloliquefaciens</i>	22
4	Optimalt BBA	β -amylase	from barley	7
5	A7130	β -amylase	from barley	26
6	Spezyme DBA	β -amylase	from barley	12
7	NS22035	Amyloglucosidase		7
8	Spirizyme	Amyloglucosidase		9
9	Gammadex	Amyloglucosidase	<i>A. niger</i>	4
10	Dextrozyme	Amyloglucosidase	<i>A. niger</i>	7
11	A7095	Amyloglucosidase	<i>A. niger</i>	12
12	Novamyl L	Maltogenic amylase	<i>B. stearrowthermophilus</i>	2
13	Veron Xtender	Maltogenic amylase	<i>B. stearrowthermophilus</i>	31 ^a

^a Activity in U/mg

Liquefaction amylases

1 U = amount of enzyme that liberates 1 μmol maltose per minute at pH 6.0, 25 $^{\circ}\text{C}$ using starch as the substrate

Entry	Commercial name	Enzyme origin	Hydrolytic activity (U/ μL)
1	Clarase L	<i>Aspergillus oryzae</i>	120
2	Neomalz H ₂ O	<i>Bacillus subtilis</i>	21
3	Kleitase T10S	<i>Bacillus subtilis</i>	14
4	Liquozyme Supra	Thermostable α -amylase	9
5	Gamalpha P120L	Thermostable α -amylase	10
6	Gamalpha Spezial	Thermostable α -amylase	12
7	Spezyme FRED	<i>Bacillus licheniformis</i>	10
8	Spezyme AA	<i>Bacillus licheniformis</i>	16
9	Spezyme Alpha	<i>Bacillus licheniformis</i>	11
10	Clearflow AA	<i>Bacillus licheniformis</i>	12

Figure S5 Remaining activity of the tested amylases after incubation in 30 v% 2-HEA solution at 60 °C for 15 minutes.

